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WHITE-TAILED DEER BROWSING ON NATURAL CONIFER SEEDLINGS 1/

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The economy of Lincoln County, Montana, is primarily concerned with the lumber industry. The future of this industry depends upon adequate regeneration of forests that are now being harvested. The forest regeneration is hampered by several factors including lack of proper seedbed conditions, competition with other vegetation, and destruction of seeds and seedlings by animals. All of these retarding factors are receiving attention with a view to improving forest reproduction. Of special concern here is the destruction of seedlings by deer. Two papers have already been published showing that deer browse extensively on young ponderosa pine and Douglas-fir trees 2/, and that experimental plantations of the pine were practically wiped out by deer browsing. 3/ Neither of these studies was designed to show the extent of browsing on very young seedlings. General surveys of deer browsing tend to overlook this phase of the subject because the very act of browsing a small seedling usually wipes out evidence of the deed, the entire plant being consumed. Recent comparative studies of the numbers of natural seedlings inside and outside deer exclosure plots show the extent of deer damage to seedlings.

In 1946 deer exclosure fences were built around seven plots in ponderosa pine forest on the lower Fisher River in Lincoln County, Montana. The plots were 16 x 32 feet in size. Near each exclosure a comparable check plot was marked but left unfenced. Three of these sets of exclosures and check plots were established on Cow Creek and four of them on Richards Creek about four miles away from the first ones.

1/ Many persons and organizations have contributed to this study. They include a number of Biologists of the Montana State Fish and Game Department; Forest Supervisors, Staffmen and District Rangers of the Kootenai National Forest; and personnel of the Northern Rocky Mountain Forest and Range Experiment Station. Without their efforts the project would not have been possible.

2/ The effects of deer on conifer reproduction in northwestern Montana, by Lowell Adams, Jour. Forestry 47(11):909-913. November 1949.

3/ White-tailed deer browsing on ponderosa pine plantations, by Lowell Adams, Northern Rocky Mountain Forest and Range Experiment Station, Research Note No. 89. February 1951.

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In 1951 the conifer seedlings were counted on all the plots. There is a striking difference in the number of seedlings inside the protective fences and the number on the check plots exposed to deer browsing. The tally of ponderosa pine seedlings is shown in Table 1.

Table 1.--Ponderosa pine seedlings on exclosures and check plots.

Plot Number	Number of seedlings classified by year of germination													
	Exclosures							Check Plots						
	'51	'50	'49	'48	'47	'46	Total	'51	'50	'49	'48	'47	'46	Total
							Cow Creek							
1	3	-	6	2	1	1	13	-	-	-	-	-	-	-
2	-	2	2	-	1	-	5	-	-	-	-	-	-	-
3	-	8	3	7	1	-	19	-	-	-	-	-	-	-
							Richards Creek							
4	-	9	10	8	4	-	31	-	1	7	8	-	-	16
5	1	2	5	-	5	3	16	-	-	-	-	-	-	-
6	-	4	6	6	6	2	24	-	-	-	-	-	-	-
7	-	2	3	-	-	1	6	-	1	1	-	-	-	2
Total	4	27	35	23	18	7	114	-	2	8	8	-	-	18

With a total of 114 seedlings within the exclosure and only 18 on the check plots, it is obvious that a highly significant difference exists. If the number in the exclosures is taken as the normal number to be expected in the absence of deer browsing, then the browsing has destroyed approximately 84 percent of the expected seedlings on the check plots.

Douglas-fir seedlings show a similar ratio of numbers in the exclosures and on the check plots (Table 2). There are totals of 197 seedlings inside the exclosures and 68 on the check plots.

Table 2.--Douglas-fir seedlings on exclosures and check plots.

Plot Number	Number of seedlings classified by year of germination											
	Exclosures						Check Plots					
	'51	'50	'49	'48	'47 & older	Total	'51	'50	'49	'48	'47 & older	Total
					Cow Creek							
1	1	1	5	7	5	19	-	-	-	-	-	-
2	-	9	9	21	8	47	-	1	-	-	-	1
3	1	-	4	6	1	12	-	-	-	-	-	-
					Richards Creek							
4	-	6	11	16	12	45	-	6	20	18	17	61
5	1	-	2	5	14	22	-	-	1	-	-	1
6	-	-	-	5	11	16	-	-	-	-	-	-
7	-	-	7	6	23	36	-	-	2	-	3	5
Total	3	16	38	66	74	197	-	7	23	18	20	68

Note that the number of Douglas-fir seedlings is greater than the number of pine seedlings (197 fir to 114 pine). But the proportion of pine browsed is significantly greater than the proportion of fir browsed (84 percent of the pine compared to 65 percent of the fir). This is particularly important since the pine is of much greater economic importance than the fir.

Discussion

Findings of the exclosure study indicate rather clearly that deer are seriously depleting conifer seedlings, especially ponderosa pine, in the areas which were investigated. Although a solution to the problem is not offered, because it is beyond the scope of the present study, several questions may be asked. Should the management objective for the areas under consideration be to produce the greatest number of deer, the greatest volume of pine, or some reasonable compromise in production of both deer and timber? Are the greatest numbers of deer being produced under the present conditions where winter food scarcity forces the deer to consume tiny and supposedly not-too-palatable conifer seedlings? What deer population can the tract support without jeopardizing future growth of ponderosa pine?